

Red Bank Creek Bridge  
Rawson Road at Red Bank Creek  
Red Bluff Vicinity  
Tehama County  
California

HAER No. CA-171

HAER  
CAL  
52-REBLUV  
2-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record  
National Park Service  
Western Region  
Department of the Interior  
San Francisco, CA 94107

HISTORIC AMERICAN ENGINEERING RECORD

RED BANK CREEK BRIDGE  
HAER No. CA-171

HAER  
CAL  
52-REBLUV,  
2-

**Location:** Rawson Road crossing of Red Bank Creek, Red Bluff  
vicinity, Tehama County, California.

UTM: 10-564883.4443548  
Quad: Red Bluff East, Calif. 7.5'

**Date of Construction:** 1894.

**Engineer:** Pacific Bridge Company of San Francisco

**Present Owner:** Tehama County  
Department of Public Works  
9380 San Benito Avenue  
Gerber CA 96035

**Present Use:** Highway bridge.

**Significance:** The Red Bank Creek Bridge on Rawson Road is one of the few remaining bridges erected by the Pacific Bridge Company of San Francisco. In addition, it is also a rare California example of a truss bridge with non-structural, architectonic decoration, here in the form of Classical urns atop the end posts. This bridge, with its Pratt truss main span, was determined eligible for inclusion on the National Register of Historic Places under Criterion C at the local level of significance.

**Report Prepared By:** John W. Snyder  
Co-Principal  
P.S. Preservation Services  
P.O. Box 191275  
Sacramento CA 95819

George F. Petershagen  
Registered Professional Historian  
P.O. Box 1508  
Hayfork CA 96041

## I. DESCRIPTION

The Red Bank Creek Bridge on Rawson Road is an 18-span structure, with 17 timber stringer approach spans and a 100-foot through truss main span, giving an overall length of 224.6 feet, with a width of 18 feet. Vertical clearance is 17 feet at centerline, and 15 feet 8 inches beneath the portal bracing. The Pacific Bridge Company of San Francisco fabricated and erected the main span, a pin-connected Pratt truss, in 1894. The bridge has a 15-foot, five-inch clearance above Red Bank Creek, and Tehama County erected the present approach spans in 1978 after the flood-swollen creek destroyed the original timber stringer approach spans on three-pile timber bents. The main span is supported at both ends on lally columns, concrete-filled riveted iron pipe piers. Two-column H-beam bents founded on reinforced concrete footings support the approach spans, with a reinforced concrete abutment at the northwest end of the approach spans. The bridge spans Red Bank Creek at right angles, on a southeast-northwest alignment.

The Pratt truss main span has five 20-foot panels, and the truss height is also 20 feet. The center-to-center distance between the trusses is 19 feet. The end posts and top chord are made up of two 6-inch by 2-inch channels with a 12-inch by 5/16-inch cover plate; decorative urns rest at the ends of the top chords, above the end posts. Lower chords are pairs of 2-inch and 3-inch eye bars, 11/16-inch thick. Vertical tension members are pairs of 1-1/2-inch wide eye bars, 5/8-inch thick, while diagonal tension members are pairs of 2-1/2-inch wide eye bars, 1/2-inch thick; counters are two 7/8-inch diameter rods. The built-up vertical compression members are comprised of two five-inch by 1-3/4-inch channels with steel lacing joining them. Records simply describe the sway bracing as "light."

## II. HISTORICAL INFORMATION

### Truss Bridge Development in California

The truss bridge--any bridge whose individual members are connected in a triangular pattern--dates to at least the 16th century, when Palladio depicted a truss bridge in his *Architecture*. For practical purposes, however, the metal truss bridge dates to the 1840s, when English and American designers invented and patented the truss forms which, originally executed in wood and iron, established the basis for later large-scale construction of metal truss bridges. These mid-19th century truss forms, particularly the Pratt and Warren trusses, facilitated the expansion of the American railroads in the later 19th century, and proved instrumental in highway construction in the late 19th and early 20th centuries.

Following its admission to the Union in 1850, California's maturity paralleled that of the American metal truss bridge industry. Indeed, one can find examples of all phases of metal truss bridge design--from the pioneering truss types of the 1840s to the bold long-span cantilevers of the 1920 to the movable truss spans of the early-to-mid-20th century--along California's highways.

In California, as elsewhere, railroad bridges were the chief representatives of 19th century truss bridges. California counties built few bridges before 1880, and it

required the coming of the automobile age in the early years of this century before public agencies constructed substantial numbers of highway bridges. Thus extant 19th century highway truss bridges in California take the same structural form as their railroad counterparts of the period [and a number are former railroad bridges adaptively reused]. A number of California firms fabricated and erected truss bridges during the 19th century.

A number of factors influenced truss bridges in the 20th century. The organization of the American Bridge Company as a subsidiary of U.S. Steel saw the creation of a national firm capable of overwhelming local bridge companies throughout the nation, including those in California. At the time of its formation in 1902, American Bridge controlled some fifty percent of the country's metal bridge fabrication capacity, and it soon dominated truss fabrication nationally.

After 1900, county surveyors--and later state bridge designers--played a more active role in bridge design. During the 19th century, bridge companies had commonly designed and built truss bridges. In the 20th century, public officials or their private engineering consultants designed most truss--and other--bridges.

Also after 1900, the truss bridge fell into disfavor for use in cities or in sensitive rural areas. The truss was anathema to City Beautiful advocates such as Charles Mulford Robinson. In 1909 Robinson advised the City of Los Angeles that its existing truss bridges were "...about as ugly as they can be. As these are replaced, handsome structures should be substituted." The resulting "handsome" bridge was almost always of reinforced concrete construction, usually with architectural embellishment.

These three trends then, coupled with a substantial increase in the number of bridges being built, brought about changes in California's truss bridges. After 1900 the typical truss bridge was designed by a county surveyor to standard American Bridge Company specifications, and was located at a major crossing in a rural area. Further, truss bridges accounted for a decreasing proportion of the total number of bridges being built, and by the 1930s was little-used for small to moderate length crossings.

### **The Red Bank Creek Bridge**

The minutes of the Tehama County Board of Supervisors and Tehama County road records bear witness to the local demand for improved roads and bridges, a demand typical throughout California during the last decade of the 19th century. These sources record, for example, the Board of Supervisors' acceptance of several new bridges either as new construction or as replacements of outmoded wooden wagon bridges during this period. In addition, authorization and construction of several of Tehama County's major roads such as the Corning-Vina Road occupied much of the Board's attention, and the vast majority of the Board's minutes for 1894 beyond those items comprises consideration and authorization of payment for road claims.

By 1894, Rawson Road had become the responsibility of Tehama County. On April 3, 1888 the Board of Supervisors passed a resolution declaring it a public highway and

accepting it on behalf of the county. The Rawson family, important in the development of Tehama County's sheep industry, pushed for county road status in order to provide a reliable route between theirs and surrounding ranches and Red Bluff, the local transportation hub and commercial center. The Rawsons agreed to construct the grade at the road's crossing of Red Bank Creek.

The first mention of an improved crossing of Red Bank Creek appears in the September 24, 1894 authorization of payment of \$50.00 to Victor Bacrisina for the right-of-way for the bridge crossing. On that same day Supervisor D.B. Lyon offered a motion to authorize the Board's clerk to advertise for bids, plans, specifications, strain sheets, and working details for a single-span iron and steel bridge on concrete-filled cylinder piers. By the terms of the motion, bids were to close to 4:30 p.m. on October 12, 1894. Supervisor O. Leininger seconded Lyon's motion, and it passed unanimously.

Several contractors submitted bids for the bridge. At the Board meeting of October 13, 1894 one T.D. Warwick requested permission to submit a bid, but the Board denied it as being beyond the deadline. Similarly, they dismissed the bid of Darby, Laydon & Company for noncompliance as it did not include the required surety check for ten percent of the bid. The Board honored bids from Risdon Iron and Locomotive Works of San Francisco in the amount of \$4,250, from B. McMahon and Sons in the amount of \$4,198, and two bids from Pacific Bridge Company. One Pacific Bridge bid, for \$3,897, proposed the same 75-foot bridge offered by the other bidders. The winning bid was Pacific Bridge's second proposal for a 100-foot span with approaches. Supervisor D.B. Lyon made the motion to accept the bid, with a second from Supervisor W. Bressler; the motion passed 4-0, with one supervisor absent.

Following a practice common to the Tehama County Board of Supervisors, on December 5, 1894 the Board appointed a committee of three to inspect the bridge and report on its compliance with the accepted plans. Supervisor C.S. Jobe joined Lyon and Bressler on the committee. The Board had approved one alteration during construction, to allow for longer-than-anticipated pier cylinders, an extra cost of \$247.30. In the event, the committee could not function due to Bressler's defeat in the general election. So on January 8, 1895 the entire Board appointed itself the "inspection committee." That same day they accepted the bridge from the contractors, voting to pay \$227.00 from the county's District 2 road fund, \$500.00 from the General Road Fund, and \$3747.30 from the General Fund to Pacific Bridge.

In the decades that followed, the county performed only necessary preventive maintenance on the bridge, including painting, minor corrective maintenance upon the trusses, and replacement of some of the wooden decking. The state first inspected the bridge in 1937, finding it in generally good condition. There was evidence that at least one of the original approach span bents had been replaced in-kind, and a few timber stringers were broken. While the state inspector found the truss sway bracing inadequate, he concluded that the floor system limited the bridge's capacity, and recommended the bridge be posted for a limit of six tons per vehicle and trailer, and 12 tons of loose livestock, the latter reflecting the existing rural use of the structure. He also recommended repair of the broken deck stringers.

In 1952 the county renewed the timber portions of the bridge, including the bents, stringers, deck and rail. Thus the next state inspection, in 1954, found the bridge in "fairly good condition." The inspector noted the truss was devoid of paint and lightly coated with rust, but generally in adjustment. He also found considerable scour of the approach span footings by the creek. Based on this inspection, the state found the end posts and top chords of the truss to be the limiting members of the bridge, and recommended raising the load limit to nine tons per vehicle; the recommendation to rescind the livestock posting evidently reflected changing ranching practices, with fewer stock drives.

Four years later, in 1958, state inspectors returned to find that the steel pile abutments, steel caps, and sheet steel back walls and wingwalls had replaced the original concrete abutments, and that the county had added an additional approach span at the northwest end due to movement of the creek channel. While the previously-noted scour conditions affecting the approach spans had improved, the condition of the truss had not. The inspector found one lower lateral brace torn off and lying in the stream bed, and other lower lateral braces bent, loose, and ineffective, apparently the result of high water. In addition, the truss had a cracked stringer and a loose diagonal tension member in the downstream truss. The inspection, however, did not change the load limit on the bridge.

In July 1960 the Red Bluff school district found the nine-ton load limit to be a problem. The district was to open a new elementary school on Rawson Road that fall, and the load limit would not permit school buses to use the bridge, necessitating increased travel time and mileage on a more circuitous route on State Highway 99W. District officials wrote to ask the state inspectors if the load limit might be increased to permit school bus use. The state's reply, noting that this was one of the oldest bridges in the county and not practicable to strengthen, was negative, and suggested the district take up the problem with the county Road Commissioner. There is no evidence of any solution being reached.

The next state inspection in February 1964 found damage from the January 1964 floods largely repaired. There was, however, traffic damage to the approach spans, though not severe enough to reduce load capacity. More serious was severe decay at the bottom of some of the timber piles of the approach span bents. Finally, the damaged lower lateral braces of the truss remained unrepaired.

Fifteen years passed between state inspections, and the next one, in March 1979, followed the severe flooding of Red Bank Creek in the Spring of 1978. That year the county closed the bridge from February 14 until March 21 to allow repairs of the approach spans, repairs to the deck of the truss span which had been overtopped by flood waters, and various other structural repairs. They also replaced the railings with half-round galvanized steel rails mounted on wood posts. During this period also the county replaced the asphalt deck surface on the bridge. Thus the 1979 inspection found the truss and other steel members freshly painted, and the bridge in generally good condition.

The inspection schedule for the Red Bank Creek Bridge increased in the 1980s, and the 1982 inspection revealed few changes, except that one end post of the truss had been hit by traffic, deforming it and loosening the counters. The county had

repaired the end post, so the inspector recommended re-tensioning the loose truss members. The 1984 inspection resulted in a recommendation to replace rotten wood in the deck. No new deterioration was noted in an inspection the following year. Though two years passed before the next inspection in 1987, that one resulted in a recommendation that the bridge be inspected every twelve months.

In February 1988 the county contacted the state to inform them of serious damage to an end post of the truss by a hit-and-run vehicle. The resulting state inspection found the bridge unsafe for all vehicles, and the county closed the bridge until they could repair or replace the damage end post. They were subsequently able to repair the element by straightening it and welding a 1/4-inch thick, 13-inch wide, eight-foot long steel plate to the bottom side. By March the bridge was re-opened with its nine-ton load limit, though the state noted it to be in "generally marginal condition." Annual inspections thereafter, through 1994, have revealed nothing unusual, just the expected deterioration and repair of timber elements, and fading and chalking of the paint on the steel members.

### **Pacific Bridge Company**

The Pacific Bridge Company and its successor firm, the Pacific Construction Company, were major building contractors on the Pacific Coast. It was also one of the few California bridge companies that successfully transitioned from building metal trusses in the 19th century to the construction of the reinforced concrete bridges in the 20th century.

William Gorrill, a pioneer Oakland, California contractor had founded Pacific Bridge Company in 1869. His nephew, Charles Frederick Swigert, joined him in 1880 and became president of the company upon Gorrill's retirement in 1885. Swigert then moved the main offices of the firm to Portland, Oregon. In 1898 the company changed its name to Pacific Construction Company. From both the Bay Area and Portland, the company did bridge and building work all along the Pacific Coast, from Canada to Central America. Indeed, at about the same time as their construction of the Red Bank Creek Bridge, they were also working on the construction of the Ferry Building in San Francisco. Only four of their 19th century highway bridges, and one 20th century highway bridge, are known to be extant in California, the earliest known being a covered bridge--now privately owned--built in 1872 near Santa Cruz for the California Powder Works.

### **III. SOURCES**

Akana, Eric. "Supplementary Bridge Report, Red Bank Creek Bridge," unpublished report, California Department of Transportation, Sacramento, February 28, 1994.

Bateson, C.C., Administrative Assistant of Red Bluff Public Schools to Bridge Department, Division of Highways, LS, July 7, 1960.

"Charles Swigert Dies," *Western Construction News*, 10, July 1935, p. 208

- Comp, T. Allen and Donald Jackson. "Bridge Truss Types: A Guide to Dating and Identifying," *History News*, 32, 5, May 1975.
- Darnell, Victor C. *A Dictionary of American Bridge-Building Companies, 1840-1900*. Washington, D.C.: Society for Industrial Archaeology, Occasional Publication No. 2, 1984.
- Elliott, A.L. "Bridge Inspection Report, Red Bank Creek Bridge," unpublished report, California Department of Transportation, Sacramento, March 5, 1937.
- Goldsmith, Paul. "Supplementary Bridge Report, Red Bank Creek Bridge," unpublished report, California Department of Transportation, Sacramento, December 19, 1985.
- Goldsmith, Paul. "Supplementary Bridge Report, Red Bank Creek Bridge," unpublished report, California Department of Transportation, Sacramento, January 26, 1987.
- Goldsmith, Paul. "Supplementary Bridge Report, Red Bank Creek Bridge," unpublished report, California Department of Transportation, Sacramento, March 1, 1988.
- "Goldsmith, Paul. "Supplementary Bridge Report, Red Bank Creek Bridge," unpublished report, California Department of Transportation, Sacramento, March 30, 1988.
- Goldsmith, Paul. "Supplementary Bridge Report, Red Bank Creek Bridge," unpublished report, California Department of Transportation, Sacramento, December 19, 1989.
- Hassoun, Osama. "Supplementary Bridge Report, Red Bank Creek Bridge," unpublished report, California Department of Transportation, Sacramento, May 7, 1992.
- Heggli, Frank C. "Revised Original Report, Red Bank Creek Bridge," unpublished report, California Department of Transportation, Sacramento, March 1, 1979.
- Hittell, John S. *The Commerce and Industries of the Pacific Coast of North America*. San Francisco: A.L. Bancroft & Co., 1882.
- Israel, Paul Bryan. "Spanning the Golden State: A History of Highway Bridges in California," M.A. Thesis, University of California, Santa Barbara, 1980.
- Jackson, Donald C. "Railroads, Truss Bridges, and the Rise of the Civil Engineer," *Civil Engineering*, October 1977, pp.97-101.
- Johnson, H.C. "Supplementary Bridge Report, Red Bank Creek Bridge," unpublished report, California Department of Transportation, Sacramento, November 18, 1958.



- Johnson, H.C. "Supplementary Bridge Report, Red Bank Creek Bridge," unpublished report, California Department of Transportation, Sacramento, February 4, 1964.
- Mikesell, Stephen D. *Historic Highway Bridges of California*. Sacramento: California Department of Transportation, 1991.
- Panhorst, F.W. "Century of Bridge Progress," *California Highways and Public Works*, September 1950, p.117.
- Porter, Harry A. "Supplementary Bridge Report, Red Bank Creek Bridge," unpublished report, California Department of Transportation, Sacramento, April 28, 1982.
- Porter, Harry A. "Supplementary Bridge Report, Red Bank Creek Bridge," unpublished report, California Department of Transportation, Sacramento, May 4, 1984.
- Robinson, Charles Mulford. *The City Beautiful*. Los Angeles: Report of the Los Angeles Municipal Art Commission, 1909.
- Rodgers, T.W. "Supplementary Bridge Report, Red Bank Creek Bridge," unpublished report, California Department of Transportation, Sacramento, April 27, 1954.
- The Industries of San Francisco, California*. San Francisco: Cosmopolitan Publishing Co., 1889.
- "Thematic Request for Determination of Eligibility: Historic Truss Bridges in California," unpublished report. Sacramento: California Department of Transportation, 1985.
- Tehama County Board of Supervisors Minutes, 1894-95.
- Tehama County Bridge Maintenance Records.
- Tehama County "New" Road Records.
- Tyrrell, Henry Grattan. "Bridges in Relation to the City Plan," *The Architect and Engineer*, August 1913, pp.83-93.
- Womack, J.C., State Highway Engineer to C.C. Bateson, Red Bluff Public Schools, LS, July 15, 1960.

#### IV. PROJECT INFORMATION

The existing bridge, constructed in 1894-5 across Red Bank Creek, has provided access to Red Bluff from outlying ranches for 100 years. Today, the old bridge is structurally and geometrically deficient, and subject to overtopping during flood conditions. The Tehama County Board of Supervisors has had to post the bridge for a live load limit of 9 tons for more than 60 years. The existing bridge is effectively a one-lane structure, and its alignment makes entering and exiting the bridge's

southeast end difficult. Finally, the narrow width of the bridge does not provide sufficient room for a pedestrian walkway.

Tehama County will construct a new bridge carrying Rawson Road across Red Bank Creek. The project will slightly realign Rawson Road, and the new bridge will span the creek on a skew, with its downstream end very close to the northwest end of the present bridge, and its upstream end some distance south of the southeast end of the present bridge. The new two-lane bridge will rectify the shortcomings of the existing bridge, meeting current design standards for alignment and traffic capacity, with provisions for pedestrians as well. At the time of this writing, it is the intention of Tehama County to block the present bridge to traffic and leave it in place following its replacement.